

SEQUENCE LISTING

<110> HENRY, JAMES
CAHILL, CATHERINE
YASHPAL, KIRAN

<120> APPLICATION OF ANTI-SENSE OLIGONUCLEOTIDES AND
THERAPEUTIC USES THEREOF

<130> 39245-173913

<140>

<141>

<150> 60/226,086

<151> 2000-08-18

<160> 59

<170> PatentIn Ver. 2.1

<210> 1

<211> 311

<212> PRT

<213> Homo sapiens

<400> 1

```
Met Asp Asn Val Leu Pro Val Asp Ser Asp Leu Ser Pro Asn Ile Ser
  1              5              10              15

Thr Asn Thr Ser Glu Pro Asn Gln Phe Val Gln Pro Ala Trp Gln Ile
      20              25              30

Val Leu Trp Ala Ala Ala Tyr Thr Val Ile Val Val Thr Ser Val Val
      35              40              45

Gly Asn Val Val Val Met Trp Ile Ile Leu Ala His Lys Arg Met Arg
      50              55              60

Thr Val Thr Asn Tyr Phe Leu Val Asn Leu Ala Phe Ala Glu Ala Ser
      65              70              75              80

Met Ala Ala Phe Asn Thr Val Val Asn Phe Thr Tyr Ala Val His Asn
      85              90              95

Glu Trp Tyr Tyr Gly Leu Phe Tyr Cys Lys Phe His Asn Phe Phe Pro
      100             105             110

Ile Ala Ala Val Phe Ala Ser Ile Tyr Ser Met Thr Ala Val Ala Phe
      115             120             125

Asp Arg Tyr Met Ala Ile Ile His Pro Leu Gln Pro Arg Leu Ser Ala
      130             135             140

Thr Ala Thr Lys Val Val Ile Cys Val Ile Trp Val Leu Ala Leu Leu
      145             150             155             160
```

"SEQUENCE LISTING"

Leu Ala Phe Pro Gln Gly Tyr Tyr Ser Thr Thr Glu Thr Met Pro Ser
165 170 175

Arg Val Val Cys Met Ile Glu Trp Pro Glu His Pro Asn Lys Ile Tyr
180 185 190

Glu Lys Val Tyr His Ile Cys Val Thr Val Leu Ile Tyr Phe Leu Pro
195 200 205

Leu Leu Val Ile Gly Tyr Ala Tyr Thr Val Val Gly Ile Thr Leu Trp
210 215 220

Ala Ser Glu Ile Pro Gly Asp Ser Ser Asp Arg Tyr His Glu Gln Val
225 230 235 240

Ser Ala Lys Arg Lys Val Val Lys Met Met Ile Val Val Val Cys Thr
245 250 255

Phe Ala Ile Cys Trp Leu Pro Phe His Ile Phe Phe Leu Leu Pro Tyr
260 265 270

Ile Asn Pro Asp Leu Tyr Leu Lys Lys Phe Ile Gln Gln Val Tyr Leu
275 280 285

Ala Ile Met Trp Leu Ala Met Ser Ser Thr Met Tyr Asn Pro Ile Ile
290 295 300

Tyr Cys Cys Leu Asn Asp Arg
305 310

<210> 2

<211> 1268

<212> DNA

<213> Homo sapiens

<400> 2

```

gaaaaagcct tccaccctcc tgtctggctt tagaaggacc ctgagcccca ggcgccacga 60
caggactctg ctgcagaggg gggttgtgta cagatagtag ggctttaccg cctagcttcg 120
aaatggataa cgtcctcccg gtggactcag acctctcccc aaacatctcc actaacacct 180
cggaacccaa tcagttcgtg caaccagcct ggcaaattgt cctttgggca gctgcctaca 240
cggtcattgt ggtgacctct gtgggtgggca acgtggtagt gatgtggatc atcttagccc 300
acaaaagaat gaggacagtg acgaactatt ttctggtgaa cctggccttc gcggaggcct 360
ccatggctgc attcaatata gtgggtgaact tcacctatgc tgtccacaac gaatgggtact 420
acggcctggt ctactgcaag ttccacaact tcttccccat cgccgctgtc ttcgccagta 480
tctactccat gacggctgtg gcctttgata ggtacatggc catcatacat cccctccagc 540
cccggctgtc agccacagcc accaaagtgg tcatctgtgt catctgggtc ctggctctcc 600
tgctggcctt ccccagggc tactactcaa ccacagagac catgccagc agagtcgtgt 660
gcatgatcga atggccagag catccgaaca agatttatga gaaagtgtac cacatctgtg 720
tgactgtgct gatctacttc ctccccctgc tgggtgattgg ctatgcatac accgtagtgg 780
gaatcacact atgggccagt gagatccccg gggactcctc tgaccgctac caccagcaag 840
tctctgccaa gcgcaagggt gtcaaaatga tgattgtcgt ggtgtgcacc ttcgccatct 900
gctggctgcc cttccacatc ttcttctctc tgccctacat caaccagat ctctacctga 960
agaagtttat ccagcagggtc tacctggcca tcatgtggct ggccatgagc tccaccatgt 1020
acaaccccat catctactgc tgccatcaatg acaggtgagg atcccaacc catgagctct 1080
ccaggggcc aagaccatc tacatacaca gtggccaagc ggcatacctaa atgagtaaac 1140

```

ccagctgtga gacaagaggg acaagtgggg actgcagcta acttatcatc acacaactca 1200
 gcctggctga ttatcacat ccaggaatgg gagcccggag tagactgatt ttcttttttt 1260
 cttttcca 1268

<210> 3
 <211> 311
 <212> PRT
 <213> Homo sapiens

<400> 3
 Met Asp Asn Val Leu Pro Val Asp Ser Asp Leu Ser Pro Asn Ile Ser
 1 5 10 15
 Thr Asn Thr Ser Glu Pro Asn Gln Phe Val Gln Pro Ala Trp Gln Ile
 20 25 30
 Val Leu Trp Ala Ala Ala Tyr Thr Val Ile Val Val Thr Ser Val Val
 35 40 45
 Gly Asn Val Val Val Met Trp Ile Ile Leu Ala His Lys Arg Met Arg
 50 55 60
 Thr Val Thr Asn Tyr Phe Leu Val Asn Leu Ala Phe Ala Glu Ala Ser
 65 70 75 80
 Met Ala Ala Phe Asn Thr Val Val Asn Phe Thr Tyr Ala Val His Asn
 85 90 95
 Glu Trp Tyr Tyr Gly Leu Phe Tyr Cys Lys Phe His Asn Phe Phe Pro
 100 105 110
 Ile Ala Ala Val Phe Ala Ser Ile Tyr Ser Met Thr Ala Val Ala Phe
 115 120 125
 Asp Arg Tyr Met Ala Ile Ile His Pro Leu Gln Pro Arg Leu Ser Ala
 130 135 140
 Thr Ala Thr Lys Val Val Ile Cys Val Ile Trp Val Leu Ala Leu Leu
 145 150 155 160
 Leu Ala Phe Pro Gln Gly Tyr Tyr Ser Thr Thr Glu Thr Met Pro Ser
 165 170 175
 Arg Val Val Cys Met Ile Glu Trp Pro Glu His Pro Asn Lys Ile Tyr
 180 185 190
 Glu Lys Val Tyr His Ile Cys Val Thr Val Leu Ile Tyr Phe Leu Pro
 195 200 205
 Leu Leu Val Ile Gly Tyr Ala Tyr Thr Val Val Gly Ile Thr Leu Trp
 210 215 220
 Ala Ser Glu Ile Pro Gly Asp Ser Ser Asp Arg Tyr His Glu Gln Val
 225 230 235 240
 Ser Ala Lys Arg Lys Val Val Lys Met Met Ile Val Val Val Cys Thr
 245 250 255

1200 1260 1268

Phe Ala Ile Cys Trp Leu Pro Phe His Ile Phe Phe Leu Leu Pro Tyr
260 265 270

Ile Asn Pro Asp Leu Tyr Leu Lys Lys Phe Ile Gln Gln Val Tyr Leu
275 280 285

Ala Ile Met Trp Leu Ala Met Ser Ser Thr Met Tyr Asn Pro Ile Ile
290 295 300

Tyr Cys Cys Leu Asn Asp Arg
305 310

<210> 4

<211> 1268

<212> DNA

<213> Homo sapiens

<400> 4

```

gaaaaagcct tccaccctcc tgtctggcct tagaaggacc ctgagcccca ggcgccacga 60
caggactctg ctgcagaggg gggttgtgta cagatagtag ggctttaccg cctagcttcg 120
aaatggataa cgtcctcccg gtggactcag acctctcccc aaacatctcc actaacacct 180
cggaacccaa tcagttcgtg caaccagcct ggcaaattgt cctttgggca gctgcctaca 240
cggtcattgt ggtgacctct gtggtgggca acgtggtagt gatgtggatc atcttagccc 300
acaaaagaat gaggacagt acgaactatt ttctggtgaa cctggccttc gcggaggcct 360
ccatggctgc attcaatata gtggtgaact tcacctatgc tgtccacaac gaatggtact 420
acggcctggt ctactgcaag ttccacaact tcttccccat cgccgctgtc ttccgccagta 480
tctactccat gacggctgtg gcctttgata ggtacatggc catcatacat cccctccagc 540
cccggtgtgc agccacagcc accaaagtgg tcatctgtgt catctgggtc ctggctctcc 600
tgctggcctt cccccagggc tactactcaa ccacagagac catgcccagc agagtctgtg 660
gcatgatcga atggccagag catccgaaca agatttatga gaaagtgtac cacatctgtg 720
tgactgtgct gatctacttc ctccccctgc tgggtgattgg ctatgcatac accgtagtgg 780
gaatcacact atgggccagt gagatccccg gggactcctc tgaccgctac caccgagcaag 840
tctctgccaa gcgcaagggt gtcaaaaatga tgattgtcgt ggtgtgcacc ttccgcatct 900
gctggctgcc cttccacatc ttcttcctcc tgccctacat caaccagat ctctacctga 960
agaagtttat ccagcaggtc tacctggcca tcatgtggct ggccatgagc tccaccatgt 1020
acaaccccat catctactgc tgcctcaatg acaggtgagg atcccaacc catgagctct 1080
ccagggggcca caagaccatc tacatacaca gtggccaagc ggcatcctaa atgagtaaac 1140
ccagctgtga gacaagaggg acaagtgggg actgcagcta acttatcatc acacaactca 1200
gcctggctga ttatcaccat ccaggaatgg gagcccgag tagactgatt ttcttttttt 1260
cttttcca                                     1268

```

<210> 5

<211> 407

<212> PRT

<213> Homo sapiens

<400> 5

Met Asp Asn Val Leu Pro Val Asp Ser Asp Leu Ser Pro Asn Ile Ser
1 5 10 15

Thr Asn Thr Ser Glu Pro Asn Gln Phe Val Gln Pro Ala Trp Gln Ile
20 25 30

Val Leu Trp Ala Ala Ala Tyr Thr Val Ile Val Val Thr Ser Val Val
35 40 45

Gly	Asn	Val	Val	Val	Met	Trp	Ile	Ile	Leu	Ala	His	Lys	Arg	Met	Arg
50						55					60				
Thr	Val	Thr	Asn	Tyr	Phe	Leu	Val	Asn	Leu	Ala	Phe	Ala	Glu	Ala	Ser
65					70					75					80
Met	Ala	Ala	Phe	Asn	Thr	Val	Val	Asn	Phe	Thr	Tyr	Ala	Val	His	Asn
				85					90					95	
Glu	Trp	Tyr	Tyr	Gly	Leu	Phe	Tyr	Cys	Lys	Phe	His	Asn	Phe	Phe	Pro
			100					105					110		
Ile	Ala	Ala	Val	Phe	Ala	Ser	Ile	Tyr	Ser	Met	Thr	Ala	Val	Ala	Phe
		115					120					125			
Asp	Arg	Tyr	Met	Ala	Ile	Ile	His	Pro	Leu	Gln	Pro	Arg	Leu	Ser	Ala
	130					135					140				
Thr	Ala	Thr	Lys	Val	Val	Ile	Cys	Val	Ile	Trp	Val	Leu	Ala	Leu	Leu
145				150						155					160
Leu	Ala	Phe	Pro	Gln	Gly	Tyr	Tyr	Ser	Thr	Thr	Glu	Thr	Met	Pro	Ser
				165					170					175	
Arg	Val	Val	Cys	Met	Ile	Glu	Trp	Pro	Glu	His	Pro	Asn	Lys	Ile	Tyr
			180					185					190		
Glu	Lys	Val	Tyr	His	Ile	Cys	Val	Thr	Val	Leu	Ile	Tyr	Phe	Leu	Pro
		195				200						205			
Leu	Leu	Val	Ile	Gly	Tyr	Ala	Tyr	Thr	Val	Val	Gly	Ile	Thr	Leu	Trp
	210					215					220				
Ala	Ser	Glu	Ile	Pro	Gly	Asp	Ser	Ser	Asp	Arg	Tyr	His	Glu	Gln	Val
225					230					235					240
Ser	Ala	Lys	Arg	Lys	Val	Val	Lys	Met	Met	Ile	Val	Val	Val	Cys	Thr
				245					250					255	
Phe	Ala	Ile	Cys	Trp	Leu	Pro	Phe	His	Ile	Phe	Phe	Leu	Leu	Pro	Tyr
			260					265					270		
Ile	Asn	Pro	Asp	Leu	Tyr	Leu	Lys	Lys	Phe	Ile	Gln	Gln	Val	Tyr	Leu
		275					280					285			
Ala	Ile	Met	Trp	Leu	Ala	Met	Ser	Ser	Thr	Met	Tyr	Asn	Pro	Ile	Ile
	290					295					300				
Tyr	Cys	Cys	Leu	Asn	Asp	Arg	Phe	Arg	Leu	Gly	Phe	Lys	His	Ala	Phe
305					310					315					320
Arg	Cys	Cys	Pro	Phe	Ile	Ser	Ala	Gly	Asp	Tyr	Glu	Gly	Leu	Glu	Met
				325					330					335	
Lys	Ser	Thr	Arg	Tyr	Leu	Gln	Thr	Gln	Gly	Ser	Val	Tyr	Lys	Val	Ser
			340					345					350		

Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His Glu Glu Glu
355 360 365

Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu Asp Leu Thr Ser
370 375 380

Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr Glu Ser Phe Ser
385 390 395 400

Phe Ser Ser Asn Val Leu Ser
405

<210> 6

<211> 1766

<212> DNA

<213> Homo sapiens

<400> 6

```

aattcagagc caccgcgggc aggcggggcag tgcattccaga agcgtttata ttctgagcgc 60
cagttcagct ttcaaaaaga gtgctgcccc taaaaagcct tccaccctcc tgtctgcttt 120
agaaggaccc tgagccccag gcgccagcca caggactctg ctgcagaggg gggttgtgta 180
cagatagtag gctttacgcc tagcttcgaa atggataacg tcctcccggt ggactcagac 240
ctctcccaa acatctccac taacacctcg gaaccaatc agttcgtgca accagcctgg 300
caaattgtcc tttgggcagc tgcctacacg gtcattgtgg tgacctctgt ggtgggcaac 360
gtggtagtga tgtggatcat cttagccccc aaaagaatga ggacagtgaac gaactatatt 420
ctggtgaacc tggccttcgc ggaggcctcc atggctgcat tcaatacagt ggtgaacttc 480
acctatgctg tccacaacga atggtactac ggcctgttct actgcaagtt ccacaacttc 540
tttcccatcg ccgctgtctt cgccagtatc tactccatga cggctgtggc ctttgatagg 600
tacctggcca tcatacatcc cctccagccc cggctgtcag ccacagccac caaagtgggc 660
atctgtgtca tctgggtcct ggctctcctg ctggccttcc cccagggcta ctactcaacc 720
acagagacca tgcccagcag agtcgtgtgc atgatcgaat ggccagagca tccgaacaag 780
atztatgaga aagtgtacca catctgtgtg actgtgctga tctacttctt cccctgctg 840
gtgattggct atgcatacac cgtagtggga atcacactat gggccagtga gatccccggg 900
gactcctctg accgctacca cgagcaagtc tctgccaagc gcaagggtgg caaaatgatg 960
attgtcgtgg tgtgcacctt cgccatctgc tggctgcctt tccacatctt ctctctctg 1020
ccctacatca acccagatct ctacctgaag aagtttatcc agcaggtcta cctggccatc 1080
atgtggctgg ccatgagctc caccatgtac aaccccatca tctactgctg cctcaatgac 1140
aggttccgctc tgggcttcaa gcatgccttc cggctgtgcc ccttcatcag cgccggcgac 1200
tatgaggggc tggaaatgaa atccaccggg tatctccaga cccagggcag tgtgtacaaa 1260
gtcagccgcc tggagaccac catctccaca gtggtggggg cccacgagga ggagccagag 1320
gacggcccca aggccacacc ctgctccctg gacctgacct ccaactgctc ttcacgaagt 1380
gactccaaga ccatgacaga gagcttcagc ttctcctcca atgtgctctc ctaggccaca 1440
gggcctttgg caggtgcagc cccactgcc tttgacctgc ctcccttcat gcatggaaat 1500
tcccttcatc tggaaaccatc agaaacaccc tcacactggg acttgcaaaa agggtcagta 1560
tgggttaggg aaaacattcc atccttgagt caaaaaatct caattcttcc ctatctttgc 1620
caccctcatg ctgtgtgact caaaccaaat cactgaactt tgctgagcct gtaaaaataa 1680
aggtcggacc agcttttctt caagagccca atgcattcca tttctggaag tgactttggc 1740
tgcatgcgag tgctcatttc aggatg

```

<210> 7

<211> 407

<212> PRT

<213> Homo sapiens

Met 1	Asp	Asn	Val	Leu 5	Pro	Val	Asp	Ser	Asp 10	Leu	Ser	Pro	Asn	Ile	Ser 15
Thr	Asn	Thr	Ser 20	Glu	Pro	Asn	Gln	Phe 25	Val	Gln	Pro	Ala	Trp 30	Gln	Ile
Val	Leu	Trp 35	Ala	Ala	Ala	Tyr	Thr 40	Val	Ile	Val	Val	Thr 45	Ser	Val	Val
Gly	Asn 50	Val	Val	Val	Met	Trp 55	Ile	Ile	Leu	Ala	His 60	Lys	Arg	Met	Arg
Thr 65	Val	Thr	Asn	Tyr	Phe 70	Leu	Val	Asn	Leu	Ala 75	Phe	Ala	Glu	Ala	Ser 80
Met	Ala	Ala	Phe	Asn 85	Thr	Val	Val	Asn	Phe 90	Thr	Tyr	Ala	Val	His 95	Asn
Glu	Trp	Tyr	Tyr 100	Gly	Leu	Phe	Tyr	Cys 105	Lys	Phe	His	Asn	Phe 110	Phe	Pro
Ile	Ala	Ala	Cys 115	Phe	Ala	Ser	Ile	Tyr 120	Ser	Met	Thr	Ala 125	Val	Ala	Phe
Asp 130	Arg	Tyr	Met	Ala	Ile	Ile 135	His	Pro	Leu	Gln	Pro 140	Arg	Leu	Ser	Ala
Thr 145	Ala	Thr	Lys	Val	Val 150	Ile	Cys	Val	Ile	Trp 155	Val	Leu	Ala	Leu	Leu 160
Leu	Ala	Phe	Pro	Gln 165	Gly	Tyr	Tyr	Ser	Thr 170	Thr	Glu	Thr	Met	Pro 175	Ser
Arg	Val	Val	Cys 180	Met	Ile	Glu	Trp	Pro 185	Glu	His	Pro	Asn	Lys 190	Ile	Tyr
Glu	Lys 195	Val	Tyr	His	Ile	Cys 200	Val	Thr	Val	Leu	Ile 205	Tyr	Phe	Leu	Pro
Leu 210	Leu	Val	Ile	Gly	Tyr	Ala 215	Tyr	Thr	Ile	Val	Gly 220	Ile	Thr	Leu	Trp
Ala 225	Ser	Glu	Ile	Pro	Gly 230	Asp	Ser	Ser	Asp	Arg 235	Tyr	His	Glu	Gln	Val 240
Ser	Ala	Lys	Arg	Lys 245	Val	Val	Lys	Met	Met	Ile	Val	Val	Val	Cys 255	Thr
Phe	Ala	Ile	Cys 260	Trp	Leu	Pro	Phe	His 265	Ile	Phe	Phe	Leu	Leu	Pro	Tyr
Ile	Asn 275	Pro	Asp	Leu	Tyr	Leu	Lys 280	Lys	Phe	Ile	Gln	Gln 285	Val	Tyr	Leu
Ala	Ile 290	Met	Trp	Leu	Ala	Met 295	Ser	Ser	Thr	Met	Tyr	Asn	Pro	Ile	Ile

Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe Lys His Ala Phe
 305 310 315 320
 Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu Gly Leu Glu Met
 325 330 335
 Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Ser Val Tyr Lys Val Ser
 340 345 350
 Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His Glu Glu Glu
 355 360 365
 Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu Asp Leu Thr Ser
 370 375 380
 Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr Glu Ser Phe Ser
 385 390 395 400
 Phe Ser Ser Asn Val Leu Ser
 405

<210> 8
 <211> 1230
 <212> DNA
 <213> Homo sapiens

<400> 8
 atggataacg tcctcccggt ggactcagac ctctcccaa acatctccac taacacctcg 60
 gaaccaatc agttcgtgca accagcctgg caaattgtcc tttgggcagc tgcttacacg 120
 gtcattgtgg tgacctctgt ggtgggcaac gtggtagtga tgtggatcat cttagccac 180
 aaaagaatga ggacagtgc gaactat ttt ctggtgaacc tggccttcgc ggaggcctcc 240
 atggctgcat tcaatacagt ggtgaacttc acctatgctg tccacaacga atgggtactac 300
 ggctgttct actgcaagtt ccacaacttc ttccccatcg ccgcttgctt cgccagtatc 360
 tactccatga cggctgtggc ctttgatagg tacatggcca tcatacatcc cctccagccc 420
 cggctgtcag ccacagccac caaagtggtc atctgtgtca tctgggtcct ggctctcctg 480
 ctggccttcc cccagggtca ctactcaacc acagagacca tgcccagcag agtcgtgtgc 540
 atgatcgaat ggccagagca tccgaacaag atttatgaga aagtgtacca catctgtgtg 600
 actgtgctga tctacttcct cccoctgctg gtgattggct atgcatacac catagtggga 660
 atcacactat gggccagtga gatccccggg gactcctctg accgctacca cgagcaagtc 720
 tctgccaagc gcaaggtggc caaatgatg attgtcgtgg tgtgcacctt cgccatctgc 780
 tggctgcctt tccacatctt ctctcctctg ccctacatca acccagatct ctacctgaag 840
 aagtttatcc agcaggtcta cctggccatc atgtggctgg ccatgagctc caccatgtac 900
 aaccccatca tctactgctg cctcaatgac aggttcgctc tgggcttcaa gcatgccttc 960
 cggctgtgcc ccttcacacg cgccggcgac tatgaggggc tggaaatgaa atccacccgg 1020
 tatctccaga cccagggcag tgtgtacaaa gtcagccgcc tggagaccac catctccaca 1080
 gtggtggggg cccacgagga ggagccagag gacggcccca aggccacacc ctgcctcctg 1140
 gacctgacct ccaactgctc ttcacgaagt gactccaaga ccatgacaga gagcttcagc 1200
 ttctcctcca atgtgctctc ctagggatcc 1230

<210> 9
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 9
gacgttatcc attttggggc a 21

<210> 10
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 10
gacgttatcc attttggggc 20

<210> 11
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 11
gacgttatcc attttgggg 19

<210> 12
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 12
gacgttatcc attttggg 18

<210> 13
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 13
gacgttatcc attttgg 17

<210> 14
<211> 16
<212> DNA
<213> Artificial Sequence

110350 "E050600

16

15

20

19

18

```
<210> 19
<211> 17
```

<212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 19

ttatccattt tggggca

17

<210> 20

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 20

tatccatttt ggggca

16

<210> 21

<211> 15

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 21

atccattttg gggca

15

<210> 22

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 22

ttccacatct tcttcctoct

20

<210> 23

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 23

tgatgattgt cgtggtgtgc a

21

```
<400> 28
atgcatagcc aatcaccagc a 21
```

<210> 29
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 29
 acttttggtgg ctgtggctga 20

<210> 30
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 30
 ggatgtatga tggccatgta 20

<210> 31
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 31
 catggagtag atactggcga a 21

<210> 32
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 32
 gaagaagttg tggaacttgc a 21

<210> 33
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 33
gtagacctgc tggataaact t 21

<210> 34
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 34
acagtagatg atggggttgt acat 24

<210> 35
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 35
gtgtacagat agtaggctt 19

<210> 36
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 36
cctcctgtct ggctttagaa 20

<210> 37
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 37
aaccatact gaccctttt 19

<210> 38
<211> 21
<212> DNA
<213> Artificial Sequence

14

<220>

<223> Description of Artificial Sequence: Primer

<400> 38

caaggatgga atgttttccc t

21

<210> 39

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 39

tctctacctg aagaagtt

18

<210> 40

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 40

ttcgaaatgg ataacgtcct c

21

<210> 41

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 41

aggaggaaga agatgtggaa

20

<210> 42

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 42

tgacaccac gacaatcatc a

21

<210> 43

<211> 21

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 43
 ttgcgcttgg cagagacttg c 21

<210> 44
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 44
 ttcctcctgc cctacatcaa 20

<210> 45
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 45
 tgatgattgt cgtggtgtgc a 21

<210> 46
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 46
 gtagtgggaa tcacactatg 20

<210> 47
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 47
 tgctggtgat tggctatgca t 21

16

20

20

21

21

21

<210> 53
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 53
 atgtacaacc ccatcatcta c 21

<210> 54
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 54
 aagcctacta tctgtacac 19

<210> 55
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 55
 ttctaaagcc agacaggagg 20

<210> 56
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 56
 aaaagggtca gtatgggtt 19

<210> 57
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

21

<220>
<223> Description of Artificial Sequence: Primer

18

<220>
<223> Description of Artificial Sequence: Primer

21